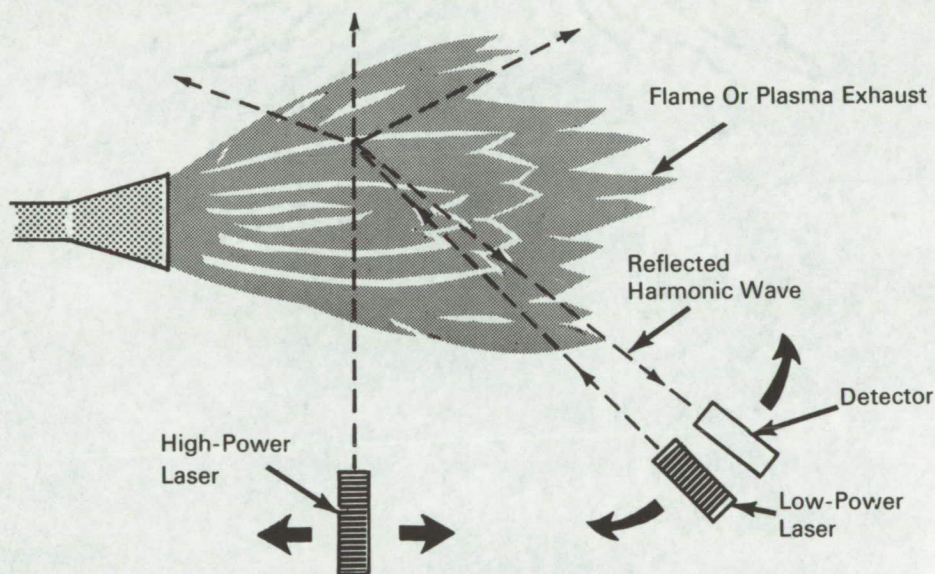


# NASA TECH BRIEF



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## Concept for Using Laser Beams to Measure Electron Density In Plasmas



A concept is presented for using laser beams as a means of measuring electron density at various points in flame or plasma exhausts. This proposed laser application is based on the theoretical behavior of two plane waves propagating through a nonlinear medium, such as a plasma. Refraction of a low-power laser beam in a plasma would give rise to nonlinear polarized waves and a reflected harmonic wave from a point in the plasma. A measure of the electron density at this point would then be obtained by detecting the amplitude of the reflected harmonic wave. A second high-power laser beam would be used to create the abrupt dielectric change required in the plasma to provide a reflected wave of sufficient amplitude.

### Note:

This development is in the conceptual stage only, and as of the date of publication of this Tech Brief neither a model nor a prototype has been constructed.

### Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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Category 01